The present invention relates to methods of treating individuals diagnosed with or suspected of suffering from diseases characterized by hyperproliferating cells which comprise the step of administering to an individual an amount of a *Flavivirus* or *Pestivirus* capsid protein, or functional fragment thereof, sufficient to kill the hyperproliferating cells. The present invention relates to methods of treating individuals diagnosed with or suspected of suffering from diseases characterized by hyperproliferating cells which comprise the step of administering to an individual an amount of WNV capsid protein, or a functional fragment thereof, sufficient to kill the hyperproliferating cells. According to some embodiments, methods comprise the steps of administering to such individuals, an effective amount of WNV capsid protein, or a functional fragment of WNV capsid protein. According to some embodiments of the present invention, the sequence that encodes the *Flavivirus* or *Pestivirus* capsid protein, or functional fragment thereof, is operably linked to regulatory elements which are necessary for expression of the sequence in cells. According to some embodiments of the present invention, methods comprise the steps of administering to such individuals, an effective amount of a nucleic acid molecule that comprises a sequence which encodes WNV capsid protein, or a functional fragment thereof. According to some embodiments of the present invention, the sequence that encodes the WNV capsid protein, or functional fragment thereof, is operably linked to regulatory elements which are necessary for expression of the sequence in cells. According to some embodiments of the present invention, the nucleic acid molecule is DNA. According to some embodiments of the present invention, the disease characterized by hyperproliferating cells is cancer or psoriasis.

The present invention relates to vaccine compositions that comprise an immunologically effective amount of capsid protein from WNV or a related member of the *Flaviviruses* or *Pestiviruses* and a pharmaceutically acceptable carrier. According to some embodiments of the present invention, the vaccine composition comprises an immunologically effective amount of an immunogenic fragment of capsid protein from WNV or a related member of the *Flaviviruses* or *Pestiviruses* and a pharmaceutically acceptable carrier.

The present invention relates to vaccine compositions that comprise a nucleic acid molecule that comprises a sequence which encodes capsid protein from WNV or a related member of the *Flaviviruses* or *Pestiviruses* and a pharmaceutically acceptable carrier. According to some embodiments of the present invention, the vaccine composition comprises a nucleic acid molecule that comprises a sequence which encodes an immunogenic fragment of capsid protein from WNV or a related member of the *Flaviviruses* or *Pestiviruses* and a pharmaceutically

acceptable carrier. According to some embodiments of the present invention, the vaccine composition comprises a nucleic acid molecule that comprises a sequence which encodes and immunogenic fragment of WNV or related *Flavivirus or Pestivirus* capsid protein, operably linked to regulatory elements necessary for expression of the sequence in a cell. According to some embodiments of the present invention, a vaccine composition comprises a nucleic acid molecule that is DNA. According to some embodiments of the present invention, a vaccine composition comprises a plasmid.

The present invention relates to methods of immunizing individuals against WNV or a related member of the *Flaviviruses* or *Pestiviruses*. The immune responses generated may be prophylactic or therapeutic. The methods comprise the steps of administering to the individual an immunologically effective amount of capsid protein, or immunogenic fragment thereof, from WNV or a related member of the *Flaviviruses* or *Pestiviruses*, or a nucleic acid molecule that encodes capsid protein, or an immunogenic fragment thereof, from WNV or a related member of the *Flaviviruses* or *Pestiviruses*.

The present invention relates to methods of identifying individuals exposed to capsid protein from WNV or a related *Flavivirus* or *Pestivirus* by detecting the presence of capsid protein from WNV or a related *Flavivirus* or *Pestivirus* in a sample using antibodies which specifically bind to capsid protein from WNV or a related *Flavivirus* or *Pestivirus*. The antibodies are preferably monoclonal antibodies. Quantification of the amount of capsid protein from WNV or a related *Flavivirus* or *Pestivirus* present in a sample of an individual may be used in determining the prognosis of an infected individual.

The present invention relates to kits for identifying individuals exposed to WNV or a related *Flavivirus* or *Pestivirus* and reagents used in such kits. The kits comprise a first container which contains antibodies which specifically bind to capsid protein from WNV or a related *Flavivirus* or *Pestivirus* and a second container which contains capsid protein from WNV or a related *Flavivirus* or *Pestivirus*. The antibodies are preferably monoclonal antibodies. The kits may be adapted for quantifying of the amount of capsid protein from WNV or a related *Flavivirus* or *Pestivirus* present in a sample of an individual. Such information may be used in determining the prognosis of an infected individual.

The present invention relates to methods of identifying individuals exposed to WNV or a related *Flavivirus* or *Pestivirus* by detecting the presence of antibodies against capsid protein from WNV or a related *Flavivirus* or *Pestivirus* in a sample using capsid protein from WNV or

a related *Flavivirus* or *Pestivirus*. Quantification of the amount of anti-capsid protein from WNV or a related *Flavivirus* or *Pestivirus* antibodies present in a sample of an individual may be used in determining the prognosis of an infected individual.

The present invention relates to kits for identifying individuals exposed to WNV or a related *Flavivirus* or *Pestivirus* and reagents used therein. The kits comprise a first container which contains antibodies which were produced in response to exposure to capsid protein from WNV or a related *Flavivirus* or *Pestivirus* and a second container which contains capsid protein from WNV or a related *Flavivirus* or *Pestivirus*. The kits may be adapted for quantifying the amount of anti-capsid protein from WNV or a related *Flavivirus* or *Pestivirus* antibodies present in a sample of an individual. Such information may be used in determining the prognosis of an infected individual.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 presents, at the top, a schematic representation of the genomic organization of the 1999 New York human isolate of WNV (WNV-HNY 1999) (GenBank accession number AF202541, Jia *et al.*, 1999, Lancet, 354:1971-1972, which is incorporated herein by reference). The capsid protein is indicated as "Cp." The bottom of the figure presents a schematic representation of the construction of WNV capsid protein expression vectors pWNVh-DJY and pWNVy-DJY. These expression constructs may also be referred to herein by alternate terms. pWNVC-DJY may be referred to herein as pWNVCh-DJY or pWNVCh, and pWNVy-DJY may be referred to herein as pWNVCy-DJY or pWNVCy.

Figure 2 presents the restriction endonuclease map of WNV capsid protein expression vector pWNVh-DJY.

Figure 3 presents the feature map of WNV capsid protein expression vector pWNVh-DJY.

Figure 4 presents the complete, annotated, double-stranded nucleotide sequence of WNV capsid protein expression vector pWNVh-DJY, having 5864 nucleotide base pairs. Restriction endonuclease sites, features, and translation information for parts of the protein that the construct expresses are indicated in the annotations. The top nucleotide strand is SEQ ID NO:1. The protein sequence of the amino-terminal sIgE leader peptide (SEQ ID NO:2) is presented below its coding region of nucleotides 917 through 970. The protein sequence of the WNV Cp protein